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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/694,099	10/20/2000	Brian J. McDermott	ContCir-2	7396

7590 02/27/2002
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EXAMINER

DINH, TUAN T

ART UNIT	PAPER NUMBER
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2827

DATE MAILED: 02/27/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/694,099

Applicant(s)

MCDERMOTT ET AL.

Examiner

Tuan T Dinh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 October 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 October 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Specification

1. The abstract of the disclosure is objected to because
2. It sets to a method of making an electronic device. There are no longer any method claims in this application.
3. Correction is required. See MPEP § 608.01(b).

Drawings

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "12" has been used to designate both **metal layer** and **through holes**. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
5. The drawings are objected to under 37 CFR 1.83(b) because they are incomplete. 37 CFR 1.83(b) reads as follows:

When the invention consists of an improvement on an old machine the drawing must when possible exhibit, in one or more views, the improved portion itself, disconnected from the old structure, and also in another view, so much only of the old structure as will suffice to show the connection of the invention therewith.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Examiner has a hard time to review and compare a figure 1 to figures 3-11. How does figure 1 would be applied to each of figures 3-11? Applicant recites the figure 1 to

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be a tooth structure; however, the figures 3-11 show a process, which is, apply coating layers into a printed circuit board.

Claim Objections

1. Claims 2-19 are objected to because of the following informalities:

Claims 2-19, line 1, change "**the electrical device**" to --the circuit board--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 16-17 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification is silent regarding "a second tooth structure, lines 1-2".

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 2-19 recite the limitation "**the electrical device**" in line 2. There is insufficient antecedent basis for this limitation in the claim.

6. Claims 1-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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Regarding claim 1, lines 7-8, it is unclear. What does applicant mean of "the metal layer...**circuitry** in a circuit board having multiple layers of **circuitry**"?

Regarding claim 17, lines 1-2, it is unclear. What does applicant mean of "...further including **a second tooth structure a tooth structure** including..."?

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1, 3-5, and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Larson (U. S. Patent 5,774,336).

As best understood to claims 1 and 16, Larson discloses a circuit board (26-figure 9D, column 6, line 50) including:

a base (101-figure 1, column 4, line 22);

a conductive layer (102, column 4, line 41) adjacent to the base;

a dielectric material (104, column 5, lines 10-11) adjacent to conductive layer;

a tooth structure including a metal layer (103-figure 3, column 4, line 63) set in the dielectric material to join the dielectric material to the metal layer; and

wherein the metal layer forms a portion of circuitry (106-figure 4, column 6, line 1) in the circuit board having multiple layers (column 2, line 44).

As to claim 3, Larson discloses the circuit board (26) wherein the circuitry (106) includes at least one micro via (24, column 6, line 51) formed in the dielectric material.

As best understood to claim 4, Larson discloses the circuit board as shown in figure 2 wherein the tooth structure includes teeth, at least 20% of the teeth are obtuse shaped. .

As best understood to claim 5, Larson discloses the circuit board as shown in figure 2 wherein the tooth structure includes teeth, at least 50% of the teeth are obtuse shaped.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 2, 6-15, 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Larson (U. S. Patent 5,774,336).

Regarding claims 2 and 17-19, even though the claims are limited by and defined by the recited “ **single or double desmear processes, plate process, or oxide replacement process**”, the determination of patentability of the product is based on the product itself, and does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claims are unpatentable even though the prior product was made by a different process. In re Thorpe, 227 USPQ 964, 966 (Fed. Cir. 1985).

As best understood to claims 6 and 8, Larson discloses all of the limitation of the claimed invention, except for at least 20% of the teeth are within the range of at least 1 tenth of a mil deep to 2 tenths of a mil deep.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a percent of teeth's deep in a range in order to minimize a thermal expansion stress among layers of the circuit board, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

As best understood to claims 7 and 9, Larson discloses all of the limitation of the claimed invention, except for at least 50% of the teeth are within the range of at least 1 tenth of a mil deep to 2 tenths of a mil deep.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a percent teeth's deep in a range in order to minimize a thermal expansion stress among layers of the circuit board, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

As best understood to claims 10-15, Larson does not show the tooth structure includes teeth, at least 5,000 teeth per linear inch can be found.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use amount of teeth per linear inch in order to minimize a thermal expansion stress among layers and improve a bonding between each of layer of the circuit board, since it has been held that discovering an optimum value of a result

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effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Bahrle et al., Akram, and Pommer et al. disclose related art.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan T Dinh whose telephone number is 703-306-5856.

The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Talbott can be reached on 703-305-9883. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-1341 for regular communications and 703-305-1341 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

TD
February 21, 2002


Kluene
Primary Examiner